Abstract of the Disclosure

A device for detecting cells and/or molecules on an electrode surface is disclosed. The device detects cells and/or molecules through measurement of impedence changes resulting from the cells and/or molecules. A disclosed embodiment of the device includes a substrate having two opposing ends along a longitudinal axis. A plurality of electrode arrays are positioned on the substrate. Each electrode array includes at least two electrodes, and each electrode is separated from at least one adjacent electrode in the electrode array by an expanse of non-conductive material. The electrode has a width at its widest point of more than about 1.5 and less than about 10 times the width of the expanse of non-conductive material. The device also includes electrically conductive traces extending substantially longitudinally to one of the two opposing ends of the substrate without intersecting another trace. Each trace is in electrical communication with at least one of the electrode arrays.